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ESTABLISHING AN INTEGRATED QUALITY MANAGEMENT SYSTEM IN ROAD FREIGHT TRANSPORT ORGANIZATIONS: PROPOSING ISO STANDARDS FOR SYSTEM OPTIMIZATION

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ABSTRACT: Integrated quality management systems represent one of the few opportunities for differentiation when it comes to organisations operating in the field of road freight transport. Due to the characteristics of this service, economic actors must focus on efficiency and overall quality to create a sustainable competitive advantage. An integrated quality management system provides the perfect framework for attaining such attributes and sustainably maintain the performance levels, through encompassing all the processes and systems that are already existing within an organisation. To ensure that not only quality, but also other aspects such as safety and sustainability are properly integrated, it is highly recommended to focus on compliance with international standards such as those proposed by ISO. Adherence to such standards can prove to be an important factor driving competitive advantage and increasing the reputability of the organisation.
KEYWORDS: competitive advantage, integrated quality management system, ISO standards, road freight transport, transport quality.

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1. INTRODUCTION

Maintaining and increasing market share are priorities for any organization, especially for those operating in highly competitive areas such as road freight transport. Given the low level of differentiation between services, it is necessary for organizations to focus on continuous improvement of all operations to ensure success.

Transport management systems have been adopted to facilitate the flow of information, increase efficiency and keep pace with the increasing complexity of the logistics chain [1]. Given the increased interest in quality within the logistics supply chain and the fact that logistics chain management and total quality management have similar principles and objectives [2][3][4], it is more than clear that road freight transport organizations, as an integral part of the logistics chain, must adapt and adopt an approach focused on achieving and maintaining quality. This approach facilitates better partnerships through assuring similar values. In this regard, the implementation of an integrated quality management system (IQMS) is a suitable solution.

The first part of this paper is concerned with defining the concept of an integrated quality management system, both generally and specifically, focused on the field of study. In this regard, the integrated quality management system will be presented in a broad sense, by referring to the specialized literature. Then, it will be transposed within the studied organization. What is more, the components of an integrated quality management system will be presented.

The standards that could be implemented within an organisation operating in this field, such as ISO 9000:2015, ISO 14001:2015 and other standards related to occupational safety and security will also be highlighted. This approach is intended to facilitate a better understanding of the concept of an integrated quality management system, as well as to allow the analysis of the quality standards that can be implemented with the help of this system.

The study was conducted through an extended literature review combined with observed practices from an organisation operating in the field of road freight transport which was chosen as the object of the study. The research has been conducted over a period of one year, in which the organisation was closely observed. The company is a medium enterprise; thus, the results of the study are specific for small and medium enterprises (SMEs).

2. DEFINING THE INTEGRATED QUALITY MANAGEMENT SYSTEM IN THE CONTEXT OF A ROAD FREIGHT TRANSPORT ORGANISATION

Within a road freight transport organization, the management system encompasses all the strategies,

regulations and internal policies that ensure the smooth running of operations and pursue the achievement of performance objectives. Thus, the management system oversees all the processes that take place within an organization and ensures their smooth functioning. Figure 1 graphically represents the management system of a road freight transport organization, including the main processes. As can be seen, even if the actual transport of goods does not include a long series of processes, to provide this service and ensure organizational efficiency, there are a multitude of processes that take place in the administrative part.

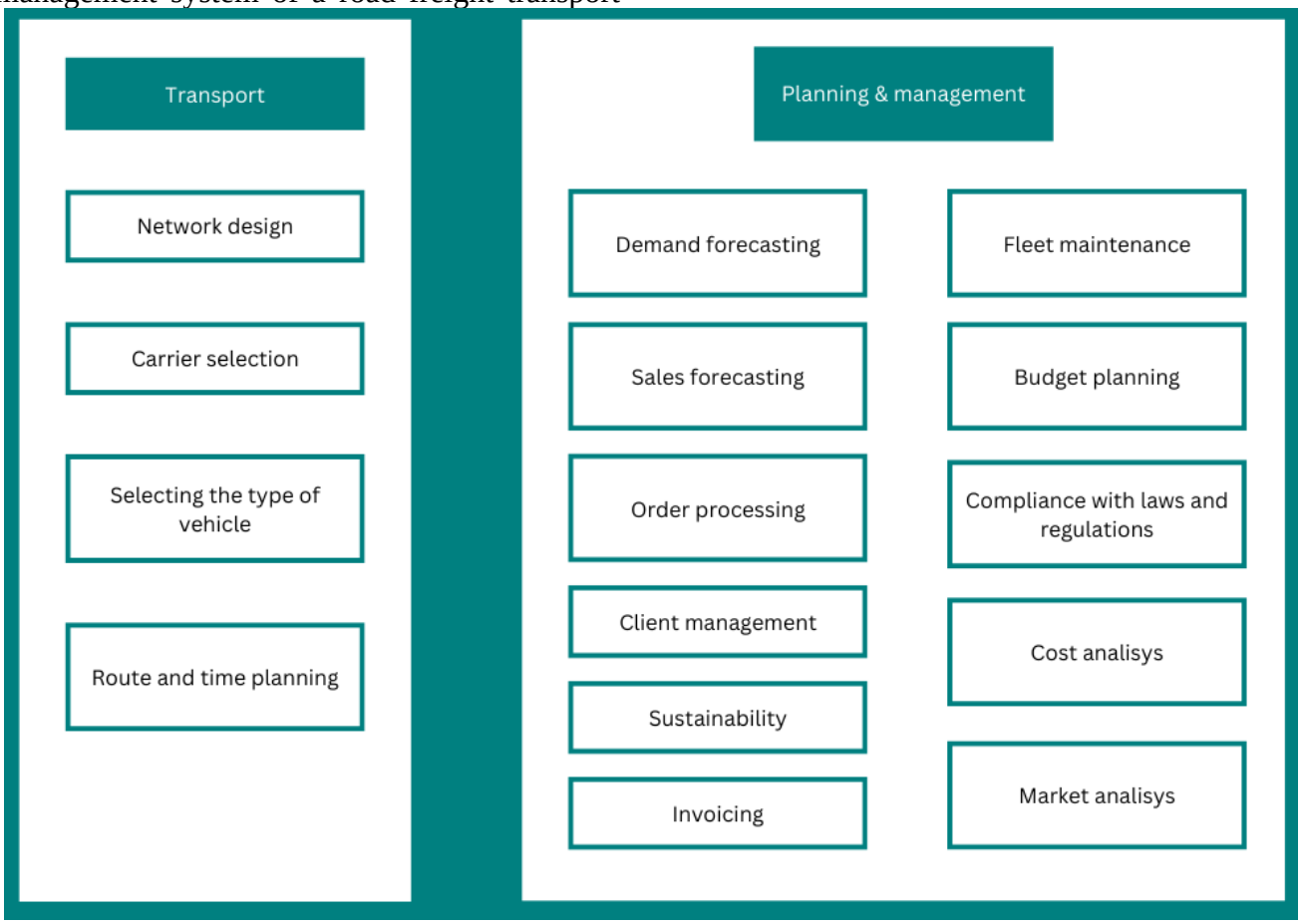

Figure 1. Management system of a road freight transport organization

Source: Adapted from [5]

An integrated management system is a comprehensive approach that combines several management systems into a single complex system that integrates all organizational processes and ensures organizational efficiency. Thus, a management system can be perceived as the totality of procedures and tools used by an organization in the process of developing a strategy, facilitating its transposition into operational activities and thus ensuring improved organizational performance [6].

By incorporating quality into all processes within an organization and into strategies, a specific approach to quality management is pursued. Implementing an IQMS involves unifying all strategies related to quality management into a single, cohesive approach [7]. Thus, an IQMS must include the quality standards that the organization either meets or aims to achieve, within a single strategy, which, at the same time, ensures compliance with legal provisions in the field of road freight transport and, simultaneously, allows for the efficient conduct of operations.

Also, a very important component of an IQMS is process management. Within a road freight transport organization, processes refer to all operations carried out to ensure the provision of the service in accordance with the terms and conditions agreed with the customer [8]. By integrating this subsystem, collaboration between departments, as well as the decrease of the number of errors, are supported, as process alignment implies better collaboration: processes are not seen individually, but as parts of a whole.

Given that the main objective of an organization is to meet and exceed customer expectations, a customer-oriented approach is a key element of an IQMS. Thus, it is necessary to give increased importance to the aspects that define quality from the consumer's point of view. In the case of a road freight transport organization, these are: on-time delivery of goods,

maintaining the quality of the goods throughout the transport, including loading, stowage and unloading operations, safety of goods, proactive communication regarding the status of the transport such as the actual operational stage (loading, in transit, unloading), the exact location of the goods at a given time and the estimated time of arrival, in accordance with traffic conditions.

In addition, an IQMS must include both risk management and performance management. The two components are interdependent, as the attitude towards risk directly influences organizational performance. A road freight transport organization that identifies the risks that may arise during the road transport of goods and implements solutions to prevent them has successfully created a substantial competitive advantage. This attitude favours the ability to ensure the provision of the service within the established deadline. Also, through organizational performance management, aspects such as, but not limited to fuel consumption, accuracy of deliveries in terms of both time and the condition of the goods at the time of unloading can be monitored. Thus, they can be constantly improved, while organizational efficiency increases.

An IQMS must be a tool through which the organization can achieve its mission. Thus, it must be developed in alignment with existing internal policies and the overall strategy. Internal policies represent the guidelines for how operations are carried out. They constitute a very important resource in ensuring the smooth running of the activities and in understanding the way of working. In the case of an IQMS, if the current policies do not include quality, they must be adapted. It is also important to have an extremely clear quality policy, which ensures compliance with standards in this area. In addition, to achieve its objective, an IQMS must include strategies focused on continuous improvement of the organization, as well as on sustainability. Given that the road freight transport industry has a significant negative impact on the environment, a sustainable approach can reduce pollution levels and, at the same time, reduce associated costs. In addition, the IQMS must focus on the importance of compliance with digitalization and data protection. Taking into consideration the quick spread of AI technologies at a global level, it is necessary to ensure that people, human rights and data privacy are at the core of the organisation, as to support an ethical workplace that harmonizes digitalization and human involvement [9].

Another extremely important component of an IQMS is the integration of the IT systems. The use of GPS tracking systems equipped with a fuel level monitoring probe in the tank is a first step in the integration of systems. Thus, the transport process of goods can be tracked in real time, and the information transmitted to the customer regarding the status of the transport has better accuracy. Also, by monitoring the transport, the timely delivery of goods can be ensured, and the route planning process can be improved with the help of information gathered during previous operations, ensuring the choice of the best route. Equipping the truck with a fuel level monitoring probe allows for the automation of the calculation in terms of consumption, reducing the risk of having fuel stolen and even faster identification of possible malfunctions by early observation of increased consumption. Also, many systems of this type have functionalities that warn about sudden braking and acceleration situations, facilitating the observation of aggressive behaviour in traffic and the implementation of corrective measures in this regard.

GPS systems can and should also be integrated into the transport management information system. Thus, information on the route, type of goods transported, type of vehicle used, customer preferences and price can be integrated with the data transmitted by the GPS system. For example, the number of kilometres travelled in carrying out a transport operation will be the real one, not the approximate one, and the time required for an operation will be monitored and used in future operations. The integration of information systems allows an overview of the organization and facilitates the process of improving efficiency.

Furthermore, the inclusion of the IT systems in the IQMS supports faster and proper digitalization. Nowadays, digital transformation is of utmost importance for organisations, as it enhances competitivity and facilitates smoother and faster operations, through the use of emerging technologies applied in all the areas of a business entity [10].

In addition, the integration of the human resource management system is crucial. An organization can only function optimally if all people within it actively collaborate to achieve its strategic objectives. Without the active involvement of people, a SMIC cannot be established. Thus, initiatives such as establishing sessions of training, education and personal development represent a necessity. For example, drivers can benefit from informational sessions on preventive driving methods. Also, to ensure quality, both employees and managers should proactively participate in quality training activities.

Occupational safety and security also represent an important component of an IQMS. This aspect ensures not only compliance with legal provisions,

but also the creation of a safe working environment, with a reduced number of work accidents. Thus, internal occupational safety and security policies must go beyond legal provisions and ensure the avoidance of risks that can cause accidents, whether minor, serious or very serious. This aspect not only guarantees the quality of the road freight transport service but also facilitates the creation of a workplace where employees can feel safe.

An IQMS would not be complete without a monitoring and evaluation component. Thus, key performance indicators (KPIs) can be established regarding aspects such as delivery time compliance, fuel consumption and transport incident rate. This ensures process monitorization and facilitates the identification of possible areas for improvement.

Thus, an IQMS must include all existing management systems within an organization, in a manner that emphasizes quality. In Figure 2 an IQMS is graphically represented, illustrating all its components. The quality management system has not been included, as it is obvious, by definition, that the qualitative aspect is intrinsic to an IQMS. Furthermore, quality is not necessarily a system to be included, but more of a strategy that should be implemented across all over the organization.

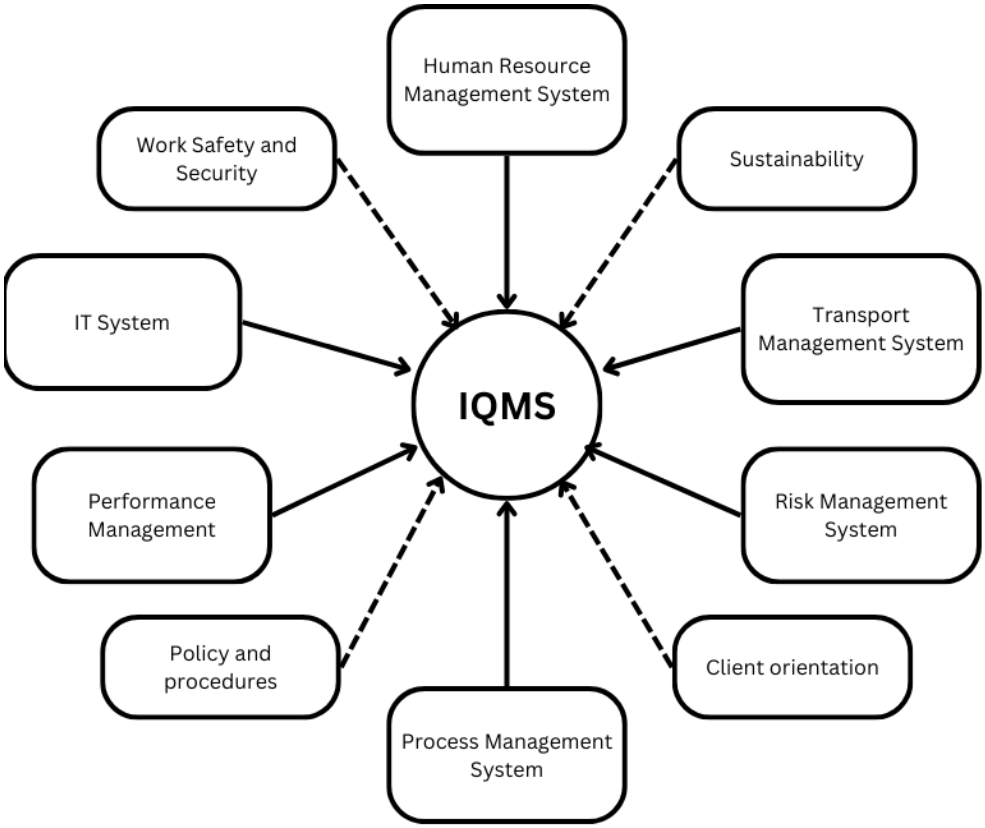

Figure 2. IQMS components

Source: Authors' own contribution

Thus, an IQMS is a holistic framework that combines multiple management systems into a single, yet cohesive approach, thereby increasing organizational efficiency and ensuring compliance with legal regulations in the field of road freight transport. Quality management is a fundamental component of an IQMS, emphasizing the determinants of customer orientation, such as punctual delivery, transparent communication, safety and proactive involvement.

3. ISO STANDARDS ELIGIBLE FOR IMPLEMENTATION

Adherence to national or international quality standards is a method of quality assurance and a factor that facilitates the achievement and maintenance of a competitive advantage. By implementing and certifying quality standards, the organisation showcases their reliability [11], and in addition, the level of customer confidence will likely increase. There are a limited number of standards that apply to road freight transport, including: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 39001:2015, ISO 28000:2022, ISO 31000:2022, ISO 50001:2018. In addition to these, there are national and international legal provisions regarding occupational safety and security, road freight transport, waste transport, feed transport, etc., which will not be discussed in this subchapter, as they do not indicate quality standards, but provisions that must be complied with. However, it is important to take into consideration that implementing ISO standards will likely have a positive impact on compliance with

legal requirements. It is very important to mention that there are many more standards that could be implemented within a road freight transport organization. The selection of the seven standards to be detailed was carried out following a close analysis of the organization, its existing strategies and its objectives, both short-term and long-term.

3.1 ISO 9001:2015 – Quality management systems

The implementation of this standard consists of an approach focused on quality management, which ensures organizational efficiency from all points of view. Thus, quality becomes an intrinsic attribute of the organization and, in turn, facilitates higher performance [12]. In order to implement this standard, the standardization of processes such as, but not limited to route planning, delivery planning, goods handling, as well as ancillary processes such as data processing, must be standardized. In addition, it is necessary to monitor organizational performance, so as to ensure continuous improvement of processes. It is also necessary to implement corrective measures in case of non-conformities. For example, if it is observed that, in practice, a route is better than the recommended one, the optimal route will be chosen from a realistic point of view. A reward system can also be implemented for proposals focused on increasing efficiency. Should it be successful, the employee should receive fair compensation.

3.2 ISO 14001:2015 – Environmental management system

This standard is consistent with the social responsibility of the organization. Thus, although the financial goal of the organization is to produce profit, from a social point of view, the organization has the obligation to protect the environment and to actively participate in initiatives that improve the quality of life and bring added value to society. To implement this standard, there are several activities that the organization can undertake. First of all, it can reduce fuel consumption associated with the road transport of goods, by choosing the optimal route, optimization, but also investing in a more efficient fleet, with a reduced level of pollutant emissions. It can also perform an analysis of the organization's carbon footprint, thus identifying which auxiliary activities contribute negatively. For example, the fleet of cars used for carrying out auxiliary activities, such as transporting employees, transferring documents, etc. can be replaced with an electric fleet. There are also measures that can be taken regarding electricity and gas consumption, but these will be debated later.

3.3 ISO 45001:2018 – Occupational health and safety management system

The first step in implementing an occupational health and safety management system is compliance with the legal provisions in this area. Thus, within a road freight transport organization there is at least one person (in organizations with less than 50 employees) or a committee that ensures the implementation of the necessary measures to prevent work accidents. Also, monthly training sessions are established for employees on situations that can cause work accidents and their avoidance, depending on the department in which they work. The next step for the organization is to analyse the effectiveness of current policies, identify aspects that can be improved and implement corrective measures. For example, driving times and driver fatigue can be monitored. It can be suggested to divide rest breaks so that drivers can take a break when they need it, and delivery time is not affected. Also, if repetitive problematic aspects are observed, measures must be implemented to prevent their occurrence.

3.4 ISO 39001:2015 – Road traffic safety management system

The purpose of implementing this standard is to increase the level of traffic safety, presenting benefits both for the organization, by reducing the number of car accidents, and for the external environment, by increasing traffic safety. In this regard, clear policies can be implemented regarding preventive conduct and appropriate behaviour of professional drivers. Also, their behaviour can be monitored through technologies associated with the GPS tracking system, and inappropriate behaviour can be identified, and corrective measures can be established, such as warnings and sanctions. It is also necessary that driving times and rest breaks are respected in accordance with legal provisions. In addition, promoting compliance with legal speed limits, road signs and preventive behaviour can have a significant impact on the implementation of this quality standard.

3.5 ISO 28000:2022 – Security management system for the logistics supply chain

This standard applies to the logistics supply chain and aims to ensure product safety throughout the entire chain. Given that road transport of goods is an essential component of it, it is recommended that the organization implement this standard, both to increase the level of trust of existing customers and to facilitate the attraction of new customers. Within the road transport of goods organization, an important step in the implementation of this standard is the

insurance and stowage of goods. By insuring goods is meant both the use of CMR insurance and/or cargo insurance, which guarantees payment for goods if they are damaged, destroyed or stolen during the road transport of goods, and the implementation of safety measures to reduce these risks. For example, parking the truck in safe places, with video surveillance, both at night and during the day. Also, preventive behaviour in traffic reduces the risk of road accidents. Additionally, security measures such as the use of a customs cable with a seal can be implemented, which reduces unauthorized access to goods.

3.6 ISO 31000:2022 – Risk management

A good risk management system involves a systematic analysis of risks and the identification and effective implementation of prevention measures. In the field of road freight transport, the main risks are vehicle breakdowns, road accidents, voluntary or involuntary deviations from optimal routing, risks associated with the transport of dangerous goods, as well as risks specific to the administrative part, such as, but not limited to, database deletion, accidents such as personnel slipping on wet floors, electrocution, etc. Also, in the case of the studied organization, which also carries out vehicle maintenance activities, the list of risks also includes aspects such as misuse of equipment and machinery, injury by involuntary release or falling of a part on the upper or lower limbs, etc. The risk analysis must include absolutely all risks that may arise. In addition, it is necessary to develop policies regarding emergency situations, such as an evacuation plan in case of fire. Legal provisions and regulations regarding fire prevention and extinguishing can be of great help in this regard.

3.7 ISO 50001:2018 – Energy management

This approach aims to increase the energy efficiency of the entire organization and, implicitly, reduce energy consumption. In this regard, it is recommended to carry out an energy audit by an expert in the field, who can propose appropriate solutions to the problems he identifies. The organization can also take measures such as using alternative energy sources, such as solar panels. These can be installed in all work points, thus reducing the consumption of electricity from non-renewable sources. Thermal energy can also be obtained from more sustainable sources, such as heat pumps. In addition, training sessions on energy management can be established, through which employees can understand the importance of this system and adopt the necessary measures, even if they are trivial. It can also be invested in better thermal insulation of buildings, so that energy losses are minimal.

Figure 3 shows the order in which the standards could be implemented within the studied organization. This was formulated in relation to the needs of the organization, so as to prioritize the achievement of objectives, the implementation of quality, and continuity.

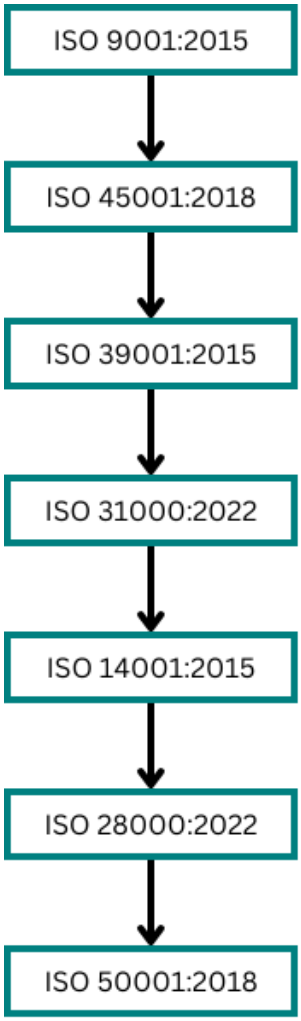

Figure 3. Successive implementation of the proposed standards

Source: Authors' own contribution

Given that the implementation of these international standards represents the preliminary step to the implementation of an IQMS, as well as the need to incorporate quality as a fundamental principle of the organization, it is recommended that the first standard implemented be ISO 9001:2015. It facilitates the formation and maintenance of a quality culture within the organization and, at the same time, increases organizational efficiency. The second standard that could be implemented is ISO 45001:2018, as it guarantees a working environment in which the safety and security of all take precedence. Thus, compliance with the legal provisions specific to occupational safety and security is guaranteed, as well as the reduction of the number of work accidents. It is suggested that the next standard implemented be ISO

39001:2015, which aims to increase road safety and, implicitly, the safety of drivers within the organization. Considering the field of road freight transport, as well as the frequency of work accidents and their increased risk, the implementation of this standard will have positive effects on reducing the number of incidents such as accidents caused in traffic and those caused by poor insurance of goods. Also, the costs associated with material and moral damages caused by road accidents will decrease significantly.

The fourth standard that can be implemented is ISO 31000:2015, by establishing clear risk management policies. In this regard, it is recommended to analyse all operations carried out, identify risks and preventive measures that can reduce the chances of these problematic aspects materializing. Also, the implementation of this standard is facilitated by the previous ones. The next step is the application of the ISO 14001:2015 standard, which aims at an environmental management system. This approach emphasizes reducing the negative impact on the environment due to increased fuel consumption, emissions, and waste. Thus, a sustainable approach is promoted, focused on sustainable development.

The sixth standard that can be implemented is ISO 28000:2022, which ensures security in the supply chain. Given the previously implemented standards, this approach is complementary by adding a specialized layer of security to the operations carried out and facilitates the integration of the organization into the supply chain by adhering to common standards. The last step is the implementation of the ISO 50001:2018 standard, which aims to develop an energy management system. The implementation of this standard will use the previously created policies regarding, in general, energy efficiency, in particular, fuel consumption. This standard was left behind because it requires a more complex approach and, at the same time, does not prioritize the achievement of organizational objectives in terms of profitability.

4. CONCLUSION

In establishing a quality culture within the organization, implementing an IQMS is an extremely important step. This management system represents a complex and comprehensive approach, which incorporates all existing systems within the organization under the umbrella of a single, integrated system, in which the emphasis is on achieving and maintaining quality. Thus, a clear implementation methodology is required, which includes all the steps that need to be carried out. In addition, it is necessary to distribute responsibilities within the organization, so as to eliminate processes that are unnecessarily repeated several times, and to ensure a better flow of information and communication.

There are several advantages that arise from implementing an IQMS, such as increasing organizational efficiency and, implicitly, profitability. Also, standardizing processes tacitly implies optimizing them and developing coherent policies that dictate the way of working. In addition, the organization's sustainability level will increase, by implementing measures such as streamlining processes and investing in new, low-emission technologies.

Due to the fact that the study was conducted through a specific approach, focusing solely on one organisation, there are certain limitations. First of all, the results cannot be generalised. In order to allow generalisation, it is necessary to extend the study in further detail and on a larger number of organisations. In addition, the study can be extended by highlighting the relation between the implementation of ISO standards and compliance with legal requirements.

All in all, this study has fulfilled its purpose regarding the importance of implementing an IQMS and adherence to ISO standards. This piece of work stands as a starting point for further research on IQMS applied in the field of road freight transport in Romania. What is more, both practitioners and academics may find these findings valuable, as they emphasize the importance of integrating quality on all levels of an organisation and provide guidelines for this pursue.

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